

Appl. No. 10/735,024
Amdt. Dated August 9, 2005
Reply to Office Action of March 9, 2005

Attorney Docket No. 81716.0116
Customer No.: 26021

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A surface-mount type antenna comprising:
a base body made of a rectangular parallelepiped dielectric or magnetic material, the base body including two opposed side surfaces and two opposed principal surfaces, the four surfaces each having a first end side part on the same end side part of each surface and a second end side part opposite the first end side part;
a feeding terminal formed at one end of one side surface of the base body; and
a radiating electrode, to
wherein one end of which the radiating electrode is connected to the feeding terminal, disposed such that its and wherein the other end of the radiating electrode is routed from one a first end side part of one a first side surface, through one a first end side part of one a first principal surface of the base body, through a first end side part on the second side surface, to another a second end side part selected from the group consisting of the second end side part of one the first principal surface, or another a second end side part of one the first side surface, or another and a second end side part of another a second principal surface, and extends farther from the other the second end side part to one the first end side part so as to be parallel to a ridge of the base body, and
is eventually formed into an open end wherein a radiating electrode terminating portion which is the other end of the radiating electrode, is formed as

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an open end, and the radiating electrode terminating portion is further formed to be short so as to fail to reach the first end side part.

2. (Currently Amended) The surface-mount type antenna of claim 1, wherein a through hole or a groove is formed in the base body made of a rectangular parallelepiped dielectric or magnetic material, the through hole being drilled all the way through from one the first side surface to ~~another~~ the second side surface, or from one end face to another end face, or from one the first principal surface to the ~~other~~ the second principal surface of the base body, and the groove being formed on the ~~other~~ second principal surface of the base body so as to penetrate all the way through from one end face to the other end face, or from one side surface to the other side surface.

3. (Currently Amended) The surface-mount type antenna of claim 1, wherein an auxiliary terminal for surface mounting is formed on the ~~other~~ second principal surface of the base body.

4. (Currently Amended) The surface-mount type antenna of claim 2, wherein an auxiliary terminal for surface mounting is formed on the ~~other~~ second principal surface of the base body.

5. (Original) The surface-mount type antenna of claim 1, wherein the rectangular parallelepiped base body is chamfered at its corner and ridge to produce a curved or flat chamfer.

6. (Original) The surface-mount type antenna of claim 1, wherein the base body is made of a dielectric material having a relative dielectric constant ϵ_r which is kept within a range from 3 to 30.

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7. (Original) The surface-mount type antenna of claim 1, wherein the base body is made of a magnetic material having a relative magnetic permeability μ_r which is kept within a range from 1 to 8.

8. (Currently Amended) An antenna apparatus comprising:
a mounting substrate having formed thereon a feeding electrode and a ground conductor layer with a linear side edge located in a vicinity of the feeding electrode; and

the surface-mount type antenna of claim 1,
wherein the antenna apparatus is constructed by mounting the surface-mount type antenna on the mounting substrate, with the ~~other~~ second principal surface of the base body arranged on a top surface of the mounting substrate, with the ridge of the base body arranged parallel to the linear side edge of the ground conductor layer, and with the feeding terminal connected to the feeding electrode.

9. (Currently Amended) An antenna apparatus comprising:
a mounting substrate having formed thereon a feeding electrode and a ground conductor layer with a linear side edge located in a vicinity of the feeding electrode; and

the surface-mount type antenna of claim 2,
wherein the antenna apparatus is constructed by mounting the surface-mount type antenna on the mounting substrate, with the ~~other~~ second principal surface of the base body arranged on a top surface of the mounting substrate, with the ridge of the base body arranged parallel to the linear side edge of the ground conductor layer, and with the feeding terminal connected to the feeding electrode.

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10. (Currently Amended) An antenna apparatus comprising:
a mounting substrate having formed thereon a feeding electrode and a ground conductor layer with a linear side edge located in a vicinity of the feeding electrode; and
the surface-mount type antenna of claim 3,
wherein the antenna apparatus is constructed by mounting the surface-mount type antenna on the mounting substrate, with the ~~ether~~ second principal surface of the base body arranged on a top surface of the mounting substrate, with the ridge of the base body arranged parallel to the linear side edge of the ground conductor layer, and with the feeding terminal connected to the feeding electrode.

11. (Currently Amended) An antenna apparatus comprising:
a mounting substrate having formed thereon a feeding electrode and a ground conductor layer with a linear side edge located in a vicinity of the feeding electrode; and
the surface-mount type antenna of claim 4,
wherein the antenna apparatus is constructed by mounting the surface-mount type antenna on the mounting substrate, with the ~~ether~~ second principal surface of the base body arranged on a top surface of the mounting substrate, with the ridge of the base body arranged parallel to the linear side edge of the ground conductor layer, and with the feeding terminal connected to the feeding electrode.

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REMARKS/ARGUMENTS

Claims 1-4 and 8-11 are amended. Claims 1-11 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Claim 1 has been amended to clarify the claim to bring into compliance with more conventional claiming practices. For instance the use of the terms such as "one end side part" and "another end side part" have been amended to --a first end side part-- and --a second end side part--. Likewise, phrases such as "one principal surface" and "another principal surface" have been amended to read --a first principal surface--and a second principal surface. Support for the limitation "through a first end side part on the second side surface," can be found in Applicant's specification, for instance at p. 18, lines 15-19. No new matter is added.

Claim Rejections—35 U.S.C. § 102

Claim 1, 3, 5, 6, 8 and 10 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Konishi et al. (U.S. Patent No. 6,707,427). Claims 1 and 3 are amended. Applicant respectfully traverses the rejection as to the amended claims.

The present invention relates to surface-mount type, which is a compact antenna, and an antenna apparatus such as a cellular phone. Amended claim 1, the only independent claim, is as follows:

1. A surface-mount type antenna comprising:
a base body made of a rectangular parallelepiped dielectric or magnetic material, the base body including two opposed side surfaces and two opposed principal surfaces, the four surfaces each having a first end side part on the same end side part of each surface and a second end side part opposite the first end side part;

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a feeding terminal formed at one end of one side surface of the base body; and

a radiating electrode, to

wherein one end of the radiating electrode is connected to the feeding terminal, and wherein the other end of the radiating electrode is routed from a first end side part of a first side surface, through a first end side part of a first principal surface of the base body, through a first end side part on the second side surface, to a second end side part selected from the group consisting of the second end side part of the first principal surface, a second end side part of the first side surface, and a second end side part of a second principal surface, and from the second end side part to the first end side part so as to be parallel to a ridge of the base body, and

wherein a radiating electrode terminating portion which is the other end of the radiating electrode, is formed as an open end, and the radiating electrode terminating portion is further formed to be short so as to fail to reach the first end side part.

Applicant respectfully submits that Konishi cannot anticipate the claimed invention because the structure of radiating electrode of the claimed invention and the Konishi radiating electrode are completely different as set forth herein. As such, Konishi cannot anticipate the claimed invention.

Specifically, the surface mount type antenna of the present invention of the present invention includes a radiating electrode that is routed on the parallelepiped base body according to following construction (with reference to Figure 1A-1D and pp. 18, line 8-p. 20, line 13 of Applicant's specification):

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(1) from a first end side part of a first side surface (See Fig. 1B, end side part 11a of side surface a)

(2) through a first end side part of a first principal surface of the base body (See Fig. 1C, end side part 11c of principal surface b),

(3) through a first end side part on the second side surface (Fig. 1D, end side part 11e of second side surface c),

(4) to a second end side part selected from the group consisting of the second end side part of the first principal surface, a second end side part of the first side surface, and a second end side part of a second principal surface, (In the embodiment of Figure 1, see Fig. 1D, second end side part 11f of side surface c, and Fig. 1C, end side part 11d of first principal surface b)

(5) from the second end side part to the first end side part so as to be parallel to a ridge of the base body (See Fig. 1B, electrode portion 20 extending from second end part 11d to first end part 11c).

Assuming Konishi, in Fig. 4, shows electrode portion 22a on a principal surface, the electrode of Konishi shows the path of the electrode as follows: (1) through a first end side part of a first principal surface (Konishi, Fig. 4, 22a) (2) to second end side part of the first principal surface (Konishi, Fig. 4, 25), through a second end side part of the first principal surface (Konishi, Fig. 4, 22b) and then to a first side surface (Fig. 4, 24). Conversely, the electrode the present invention goes from (1) from a first end side part of a first side surface (2) through a first end side part of a first principal surface of the base body and (3) through a first end side part on the second side surface. As such, the electrode of the present invention has a completely different structure than Konishi et al., and Konishi et al. cannot anticipate the present invention. Withdrawal of the rejection and allowance of claim 1 is respectfully requested. Further, nothing in Konishi et al. suggests

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modifying the radiating electrode in a manner to arrive at the radiating electrode of the present invention. As such, Applicant respectfully submits that the present claimed invention patentably distinguishes over Konishi et al.

Claims 3, 5, 6, 8 and 10 depend from claim 1 either directly or through intervening claims. As such, claims 3, 5, 6, 8 and 10 are patentable for at least the same reasons as amended claim 1. Withdrawal of the rejection and allowance of claims 3, 5, 6, 8 and 10 is respectfully requested.

Further, the present claim 1 requires "a radiating electrode terminating portion which is the other end of the radiating electrode, is formed as an open end, and the radiating electrode terminating portion is further formed to be short so as to fail to reach the first end side part." Support for the amendment is found at Figs. 1A, 2A, 3A, 4A, 6A, 7A, 8A and 9A. As explained in Applicant's specification, the resonant frequency can be increased by reducing the length of the radiating electrode terminating portion 14 (See Specification, at p. 22, lines 10-12). A stray capacitance contributes to reduction in the resonant frequency of the antenna, and thus it is important to minimize variation in the stray capacitance in order to stabilize the antenna characteristics. (Specification, at p. 23, lines 21-24). When the terminating portion is long, the stray capacitance becomes large, thereby causing reduction in the resonant frequency. Thus, by making the radiating electrode terminating portion 14 short so as to fail to reach the first end side part, it is possible to maintain the resonant frequency of the antenna, thereby stabilizing the antenna characteristics.

Claim Rejections—35 U.S.C. § 103

Claims 2, 4, 9 and 11 stand rejected under 35 U.S.C. § 103(a) as being anticipated by Konishi et al. (U.S. Patent No. 6,707,427) in view of Nagumo et al.

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(U.S. Patent Publ. 2002/0030626). Applicant respectfully traverses the rejection as to the amended claims. Applicant has already shown that nothing in Konishi et al. either teaches or suggests a surface-mount type antenna with a radiating electrode structure of amended claim 1. Nagumo et al. does not cure the deficiencies of Konishi et al. and is not relied upon by the office for doing so. As such, the combination of references fails to teach or suggest each claim limitation, and as such, the combination suggested by the office cannot render claims Claims 2, 4, 9 and 11 obvious. Withdrawal of the rejection and allowance of Claims 2, 4, 9 and 11 is respectfully requested.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being anticipated by Konishi et al. (U.S. Patent No. 6,707,427) in view of Aoyama et al (U.S. Patent Publ. 2003/0006936). Applicant has already shown that nothing in Konishi et al. either teaches or suggests a surface-mount type antenna with a radiating electrode structure of amended claim 1. Aoyama et al. does not cure the deficiencies of Konishi et al. and is not relied upon by the office for doing so. As such, the combination of references fails to teach or suggest each claim limitation, and the combination suggested by the office cannot render claims Claim 7 obvious. Withdrawal of the rejection and allowance of Claim 7 is respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6810 to discuss the steps necessary for placing the application in condition for allowance.

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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

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Date: August 9, 2005

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